



PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:

Masayuki TAKAHASHI et al

Application No.09/702,828

Group: 1714

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Examiner: Kriellion A. Sanders

For: AUTOMOBILE INTERIOR OR EXTERIOR TRIM MATERIAL

DECLARATION UNDER C.F.R. 1.132

Honorable Commissioner of Patents
And Trademark Office
Washington, D.C. 20231

Sir:

I, Mitsuru FUKUSHIMA, declare and state that:

I was graduated at Tohoku University, Division of Pharmacy, in March 1991.

In April 1991, I was employed as an engineer by ASAHI DENKA KOGYO K. K. and have been engaged in various aspects of research work with respect to polymer additives.

I. With regard to Further Additional Experiment

I am a coinventor of the above identified invention as claimed in the above identified application.

I was intimately involved with the preparation of the above identified U.S. patent application, that all the examples and comparative examples in the above identified U.S. patent application correspond to exactly to experiments made for preparing the application and by knowledge are true; and all statements made in association therewith in the above identified U.S. patent application are made on information and belief and believed to be true.

The Experiment 1, 2 and Comparative Experiment 1, 2, 3 were conducted under my supervision as follows:

Further Additional Experiments

(Experiment 1)

Block copolymer of polypropylene-ethylene (MI=8) (65 parts by weight), EPR (made by JSR CO., LTD, EP07P, MI=0.7, ethylene content 68.5 % by weight) (15 parts by weight), talc (made by NIPPON TALC CO., LTD, P-4) (20 parts by weight), Master batch of black pigment (name of the commodity is unknown) (1 parts by weight), Master batch of white pigment (name of the commodity is unknown) (3 parts by weight), calcium stearate (0.1 parts by weight), tetrakis [3 - (3, 5 - di - tert - butyl - 4 - hydroxyphenyl) propionic acid methyl] methane (made by ASAHDENKA KOGYO K. K. ADK STAB AO-60) (0.1 parts by weight), tris (2, 4 - di - tert - butylphenyl) phosphite (made by ASAHDENKA KOGYO K. K. ADK STAB 2112) (0.1 part by weight), a hindered amine (N-CH₃ type) compound represented in Experiment 1 as LA-52 in Table A (0.15 part by weight), 3, 5 - di - tert - butyl - 4 - hydroxy - benzoic acid hexadecyl (Compound No.1 in the specification) (0.05 parts by weight) were

blended in a ribbon mixer. The resultant mixture was supplied to a pelletizer and extruded at 250 °C, to thereby prepare pellets. Subsequently, the above pellets were formed into 2-mm thick sheets (Experiment 1) by extrusion at 250 °C.

(Comparative Experiment 1)

The same procedure as in Experiment 1 was performed, except that a hindered amine (N-H type) compound LA-57 represented in Table A was used instead of the hindered amine LA-52 used in Experiment 1. Sheets (2-mm thick) were obtained by same procedure as in Experiment 1.

The sheets obtained by Experiment 1 and Comparative Experiment 1 were tested for weather resistance (time until occurrence of cracking) by use of a sunshine weatherometer under the conditions of at 83 °C without water spraying. The results are shown in Table A.

Table A

	Hindered amine	Time at which cracking occurred (hr)
Experiment 1	LA-52	1200
Comparative Experiment 1	LA-57	720

LA-52: tetrakis (1, 2, 2, 6, 6-pentamethyl-4-piperidyl) 1, 2, 3, 4-butanetetracarboxylate
LA-57: tetrakis (2, 2, 6, 6-tetramethyl-4-piperidyl) 1, 2, 3, 4-butanetetracarboxylate

(Experiment 2)

Block copolymer of polypropylene-ethylene (MI=8) (65 parts by weight), EPR (made by JSR CO., LTD, ethylene content 68.5 % by weight) (15 parts by weight), talc (made by NIPPON TALC CO., LTD, P-4) (20 parts by weight), Master batch of black pigment (name of the commodity is unknown) (3 parts by weight), calcium stearate (0.1 parts by weight), tetrakis [3-(3, 5-di-tert-butyl-4-hydroxyphenyl) propionic acid methyl] methane (made by ASAHI DENKA KOGYO K. K. ADK STAB AO-60) (0.1 parts by weight), tris(2, 4-di-tert-butylphenyl) phosphite (made by ASAHI DENKA KOGYO K. K. ADK STAB 2112) (0.1 part by weight), the same hindered amine (N-CH₃ type) compound LA-52 as used in Experiment 1 in Table A (0.15 part by weight), 3, 5-di-tert-butyl-4-hydroxylbenzoic acid hexadecyl (Compound No.1 in the specification) (0.05 parts by weight) were blended in a ribbon mixer. The resultant mixture was supplied to a pelletizer and extruded at 250 °C, to thereby prepare pellets. Subsequently, the above pellets were formed into 2-mm thick sheets (Experiment 2) by extrusion at 250 °C.

(Comparative Experiment 2)

The same procedure as in Experiment 2 was performed, except that a hindered amine (N-H type) compound LA-77 represented in Table B was used instead of the hindered amine LA-52 used in Experiment 2. Sheets (2-mm thick) were obtained by same procedure as in Experiment 2.

(Comparative Example 3)

The same procedure as in Experiment 2 was performed, except that a hindered amine (N-H type) compound LA-57 represented in Table B was used instead of the hindered amine LA-52 used in Experiment 2. Sheets (2-mm thick) were obtained by same procedure as in Experiment 2.

The sheets obtained by Experiment 2, Comparative Experiment 2 and 3 were tested for weather resistance (time until occurrence of cracking) by use of a sunshine weatherometer under the conditions of at 83°C without water spraying. The results are shown in Table B.

Table B

	Hindered amine	Time at which cracking occurred (hr)
Experiment 2	LA-52	2520
Comparative Experiment 2	LA-77	1440
Comparative Experiment 3	LA-57	1200

LA-52 : tetrakis(1,2,2,6,6-pentamethyl-4-piperidyl)1,2,3,4-butanetetracarboxylate

LA-77 : bis (2,2,6,6-tetramethyl-4-piperidyl) sebacate

LA-57: tetrakis (2, 2, 6, 6-tetramethyl-4-piperidyl)1, 2, 3, 4-butanetetracarboxylate

It is apparent from the Table A and B that weather resistance of the sheet including a combination of a hindered amine photostabilizer having a 1, 2, 2, 6, 6 - pentamethyl - 4 - piperidyl group represented as hindered amine (N-CH₃ type) compound and an alkylbenzoate as above is superior to that of the sheet including a combination of a hindered amine (N- H type) compound and an alkylbenzoate in the weather resistance properties.

I further declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of title 18 of the United State Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Mitsuru Fukushima

Mitsuru FUKUSHIMA

Date: October 25 , 2004